

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2009/061204

International filing date (day/month/year)  
19.10.2009

Priority date (day/month/year)  
17.10.2008

International Patent Classification (IPC) or both national classification and IPC  
INV. C09D5/08 C08K3/22 C01G49/00

Applicant  
BATTELLE MEMORIAL INSTITUTE

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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D-80298 Munich  
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Date of completion of  
this opinion

see form  
PCT/ISA/210

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2009/061204

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of:
  - ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ on paper
    - ☐ in electronic form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in electronic form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2009/061204

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	<u>3-4, 11, 20, 25-26, 29-50, 53-56, 64, 66-71, 76-107, 110-111, 115, 130, 135-136</u>
	No: Claims	<u>1-2, 5-10, 12-19, 21-24, 27-28, 51-52, 57-63, 65, 72-75, 108-109, 112-114, 116-129, 131-134</u>
Inventive step (IS)	Yes: Claims	<u>29-50</u>
	No: Claims	<u>1-28, 51-136</u>
Industrial applicability (IA)	Yes: Claims	<u>1-136</u>
	No: Claims	

2. Citations and explanations

see separate sheet

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

- D1 DATABASE CAPLUS [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; 12 May 1984 (1984-05-12) , Hirota, Nobuyoshi: "Anticorrosion paints" XP002569967 Database accession no. 1972:476784
- D2 US 2006/134339 A1 (WANG SHENGXIAN [CN] ET AL) 22 June 2006 (2006-06-22)
- D3 US 2002/098989 A1 (HEIMANN ROBERT L [US] ET AL) 25 July 2002 (2002-07-25)
- D4 WO 2006/015756 A1 (CHEMETALL GMBH [DE]; PLIETH WALDFRIED [DE]; RAMMELT URSULA [DE]; HEBES) 16 February 2006 (2006-02-16)
- D5 US 3 904 421 A (SHIMIZU SHIGEKI ET AL) 9 September 1975 (1975-09-09)
- D6 STUART LICHT, VERA NASCHITZ, BAOHUI WANG: "Rapid chemical synthesis of the barium ferrate super-iron Fe (VI) compound, BaFeO<sub>4</sub>" JOURNAL OF POWER SOURCES, [Online] vol. 109, 15 June 2002 (2002-06-15) , pages 67-70, XP002569968 DOI: doi:10.1016/S0378-7753 (02)00041-1 [retrieved on 2010-02-23]
- D7 R. J. AUDETTE, J. W. QUAIL: "Potassium, rubidium, cesium, and barium ferrates(VI). Preparations, infrared spectra, and magnetic susceptibilities" INORGANIC CHEMISTRY, [Online] vol. 11, no. 8, August 1972 (1972-08) , XP002569971 DOI: 10.1021/ic50114a034 [retrieved on 2010-02-23]

## Re Item V

### 1. Novelty (Art 33(2) PCT)

1.1. D1 discloses a corrosion resistant coating prepared from a coating composition comprising (A) CaFeO<sub>4</sub> or SrFeO<sub>4</sub> and (B) a resin comprising the epoxy resin Epikote 1001 and the phenolic resin Bakelite R254. Said coating composition further comprises mineral spirit, non-ionic surfactant, CaCO<sub>3</sub>, ZnO and Co-naphthenate and is prepared by mixing the components (see CAS abstract). Hence, the subject matter of claims 1-2, 5-10, 12-19, 21-24, 27-28, 51-52, 57-63, 65 and 72-75 is not novel.

1.2. D2 discloses a corrosion resistant coating, prepared from a coating composition comprising (A) an corrosion inhibitor comprising an anion (A1) and (B) a resin, wherein (A1) may comprise ferrate ions (claims 85, 61, 31). D2 further teaches, that coating procedures often involves the pretreatment of the substrate in order to improve adherence of the primer (figure 1; paragraph 4). The disclosure of present claims 1 and 51 is obtained via a selection from one list. Hence, the subject matter of claims 1 and 51 is not novel.

1.3. D6 discloses a method for preparing  $\text{BaFeO}_4$  by mixing solutions comprising (A)  $\text{K}_2\text{FeO}_4$  and KOH and (B)  $\text{Ba}(\text{OH})_2$ , filtering the formed precipitate, washing said precipitate with water and drying. Therefore, the subject matter of claims 108-109, 112-114, 116-129 and 131-134 is not novel.

1.4. D7 discloses a method for preparing  $\text{BaFeO}_4$  by mixing solutions comprising (A)  $\text{K}_2\text{FeO}_4$  and (B)  $\text{BaCl}_2$  and KOH, filtering the formed precipitate, washing said precipitate with water and drying. Since D7 fails to disclose that solution (A) comprises a metal hydroxide, the subject matter of claims 108-136 as presently claimed is novel over D7.

## 2. Inventive Step (Art. 33(3) PCT)

2.1. The subject-matter of independent claims 1, 51 and 108 and dependent claims 2, 5-10, 12-19, 21-24, 27-28, 52, 57-63, 65, 72-75, 109, 112-114, 116-129 and 131-134 is not novel and can, thus, not be regarded as inventive.

2.2. The subject matter of dependent claims 3, 4, 11, 20, 25, 26, 53, 54, 55, 64 and 66-68 does not add any inventive features. Hence, the subject-matter of said claims is not novel.

2.3. The subject matter of independent claim 76 differs from D1 in that a pretreatment of the substrate is involved. This is regarded as a normal option known to the skilled person and already disclosed in e.g. D2. The subject-matter of dependent claims 77-107 does not add any inventive features. Therefore, the subject matter of claims 76-107 is not inventive.

2.4. The subject matter of dependent claims 110-111, 115, 130, 135-136 does not add any inventive features in light of D6 and D7 and is, thus, not inventive.

2.5. The subject matter of independent claim 29 and dependent claims 30-50 is neither disclosed in nor obvious in light of the cited prior art and, hence, appears to meet the requirements of the PCT with respect to novelty and inventive step.

## 3. Industrial Applicability (Art. 33(4) PCT)

3.1. The subject matter of claims 1-136 as presently claimed is industrially applicable.

## Re Item VIII

### 4. Clarity (Art. 6 PCT)

4.1. The term ***nonaqueous resin*** used in claims 1, 14, 29, 41, 51, 55, 61, 76, 95 and 106 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear.



4.2. The term **about** used in claims 8-10, 24-28, 35, 38-40, 49, 50, 60, 65, 66, 93, 94, 101, 102, 108, 114, 122, 125 and 134-136 to define ranges is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject - matter of said claims unclear.

4.3. Claims 12, 72 and 104 require that the ferrate ions are embedded in a solid solution with one or more **compatible ions**, without defining the said compatibility. Hence, the subject matter of said claims is unclear.

4.4. The term **substantially** used in claims 20, 44, 64, 98, 124 and 132 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject - matter of said claims unclear.

4.5. The term **up to at least 5wt%** used in claims 20, 44, 64 and 98 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject - matter of said claims unclear.

4.6. The term **highly soluble** used in claims 29, 35, 108 and 114 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject - matter of said claims unclear.

4.7. The term PreKote employed in claim 84 and appearing to be a registered trade mark has no precise meaning as it is not internationally accepted as a standard descriptive term, thereby rendering the definition of the subject - matter of this claim unclear.

4.8. Claims 20, 44, 64, 98, 124, 126, 127, 132 and 133 do not meet the requirements of Article 6 PCT because the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

4.9. The units of thickness **mil** employed on pages 21, 26, 33, 36 (table 4) and **inches** employed on pages 26 and 33 are not additionally expressed in terms of the units stipulated by Rule 10.1 (a) PCT.

4.10. The vague and imprecise statement in the description on page 58 regarding *the spirit of the invention* implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.

## Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	<p>For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.</p>
Amending claims under Art. 19 PCT	<p>Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.</p>
Filing a demand for international preliminary examination	<p>In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/ WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT).</p> <p>If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).</p>
Filing informal comments	<p>After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.</p>
End of the international phase	<p>At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).</p>
Relevant PCT Rules and more information	<p>Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003</p>

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XP-002569967

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1/1 - (C) FILE CAPLUS  
STN CA Caesar accession number : 1184  
AN - 1972:476784 CAPLUS  
DN - 77:76784  
OREF- 77:12665a,12668a  
ED - Entered STN: 12 May 1984  
TI - Anticorrosion paints  
IN - Hirota, Nobuyoshi  
PA - Mitsubishi Heavy Industries, Ltd.  
SO - Jpn. Tokkyo Koho, 4 pp.  
CODEN: JAXXAD  
DT - Patent  
LA - Japanese  
IC - C09D  
CC - 42-2 (Coatings, Inks, and Related Products)  
Section cross-reference(s): 55

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PN -	JP46034316B	B4	19711007	JP 1967-24029	19670417 <--

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 46034316	IC	C09D
	IPCI	C09D

AB - An anticorrosion paint contg. calcium ferrate [35764-67-1] or strontium ferrate [13773-22-3] was applied to a steel plate without removing rust to give an effective anticorrosion coating. Thus, 26 parts Epikote 1001 and 44 parts whale oil were heated 4 hr at 260.deg. and mixed with 20 parts tung oil and 10 parts Bakelite R 254, and the mixt. was heated 1 hr at 230.deg.. The product (100 parts) was dissolved in 100 parts mineral spirit, and the soln. was mixed with 0.5 part nonionic surfactant and 0.08 part Co naphthenate to give a varnish. The varnish (60 parts) was mixed with pptd. CaCO3 20 ZnO 1, and CaFeO4 20 parts and roller milled. A sand-blasted steel plate was left outdoor to rust for a month and spray-coated twice with the product without removing the rust to 25-30 .mu. each coat, dried 7 days, and subjected to a salt water spray test (JIS Z 2371) for 700 hr without failure.

ST - calcium ferrate anticorrosion coating; strontium ferrate anticorrosion coating

IT - Coating materials

(epoxy resins-phenol condensation products, contg. metal ferrates, for rusted steel)

IT - 25068-38-6 37279-79-1

RL: TEM (Technical or engineered material use); USES (Uses)

(coatings, contg. metal ferrates, for rusted steel)

IT - 13773-22-3 35764-67-1

RL: USES (Uses)

(epoxy resin-phenolic resin coatings contg., for rusted steel)